VULCAN PROJECT
ZERO CARBON LITHIUM
FROM GEOTHERMAL BRINE

September 2019 - EGEC
Summary

Potentially the Largest Lithium Project in EU
Recent JORC Exploration Target\(^1\) 10.73 – 36.20 Million Tonnes Contained Lithium Carbonate Equivalent (LCE)

Unique **Zero-Carbon** Lithium Production because of Geothermal Energy
World-first to satisfy OEMs’ stated desire for zero carbon EV raw materials supply chain

Secure Domestic Lithium Supply for EU from the Geothermal Brine Produced in Central Europe
Auto industry and governments desperate for security of supply, reduction of reliance on China

Only Lithium-Rich Geothermal Brine Field in EU
Ultra-low impact, recent precedent for permitting geothermal wells in region with widespread social acceptance

Rapid Advancement Plans
Scoping Study under way, Hatch appointed as project engineering lead

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\(^1\)Refer KRX Announcement 20/08/2019. The Company is not aware of any new information or data that materially affects the information included in the announcement. All material assumptions and technical parameters underpinning the Exploration Target in the relevant announcement continue to apply and have not materially changed.
### Vulcan Project Principals

**Dr Francis Wedin, Proposed Managing Director**
- Previously Executive Director of successful ASX-listed Exore Resources Ltd (ASX:ERX)
- PhD & BSc (Hons) in mineral exploration, completing MBA in renewables
- Discovered & defined 2 new JORC lithium resources, on two continents, in under a year, including Lynas Find, now part of Pilbara Minerals’ Pilgangoora Project in production (ASX:PLS)
- Management experience in resources sector on four continents; bilingual; EU & Australian dual nationality

**Gavin Rezos, Proposed Chairman**
- Held Executive Chairman or CEO positions of two companies that grew from start-ups to entry into the ASX 300
- Extensive international investment banking experience, as an investment banking Director of HSBC with senior multi-regional roles in investment banking as well as in legal and compliance functions
- Currently Chairman of Resource and Energy Group and principal of Viaticus Capital. Previously Non-Executive Director of Iluka Resources, Alexium International Group and Rowing Australia

**Dr Horst Kreuter, In-Country Principal**
- CEO of Geothermal Group Germany GmbH and GeoThermal Engineering GmbH (GeoT)
- Successful geothermal project development & permitting in Germany and worldwide
- Based in Karlsruhe, local to the project area in the Upper Rhine Valley
- Widespread political, investor and industry network in Germany and Europe
Current Lithium Supply Problematic

**Hard-Rock Lithium**
- High surface impact. Difficult to permit & operate in Europe
- High C-footprint from extraction, transport & processing
- Spodumene concentrate shipped to & refined in China. No strategic advantage for mining

**Salar-Type Lithium Brine**
- High carbon footprint for reagent and product transport:
  - Soda Ash USA → Chile (10,000km)
  - $\text{Li}_2\text{CO}_3$ Chile → LiOH USA → Cathode Asia → Battery/EV USA → EU Customer (50,000km)
- Uses large amounts of water in one of the driest places on earth; future license to operate?
- Evaporation process takes a long time (up to 12 months)
- Vulnerable to weather events

Battery-grade Li Supply Shortfall Forecast. The market is ripe for disruption.

https://eandt.theiet.org/content/articles/2019/08/lithium-firms-are-depleting-vital-water-supplies-in-chile-according-to-et-analysis/
Zero Carbon Supply Chains Required

- BEV raw material supply chains have a carbon footprint problem.
- OEMs are actively trying to reduce the carbon footprint of their battery supply chains to bolster the credibility of their BEV offerings.
- E.g. Volkswagen is placing great importance on having a CO₂-neutral production supply chain for its new EV line-up, with sustainability metric for suppliers on par with price²

*How will they achieve this through conventionally-extracted lithium?*

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1. refer ASX Announcement 10 July 2019
2. Volkswagen Presentation, ID. Insights, Sustainable Mobility, 2019
EU Domestic Supply of Lithium Required

- Currently **zero** EU supply of battery-grade lithium
- Phase out of fossil fuel-powered vehicle sales commencing
- 150kt per annum of LCE\(^1\) needed in EU by 2023, 290kt by 2028
- Majority of lithium supply controlled by just 5 companies, all non-EU
- Auto manufacturers & governments desperately need security of lithium supply in the 21st Century for the transition to BEVs, instead of relying solely on South American and Chinese production

Volkswagen's CEO said they are capable of building 50 million electric vehicles

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\(^1\)refer ASX Announcement 10 July 2019

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"Lithium refining is being promoted as part of a broader strategic push to develop an entire battery value-chain inside Europe."

Martoš Šefčovič, vice-president of the European Commission energy union 11/2018

Sweden's Northvolt raises $1 billion to complete funding for mammoth battery plant

CATL boosts battery cell factory in Germany to 100GWh

CATL factory could be at least as big as Tesla's Gigafactory

Who will supply?
Solution: **Zero-Carbon Lithium from Geothermal Brine**

- Well understood *geothermal* brine field with **uniquely high lithium grade**
- Dual-purpose wells to be drilled
- Renewable energy to **offset** processing **energy** for lithium plant
- Direct Lithium Extraction (DLE) to be used to produce lithium hydroxide, **avoiding evaporation**, with no pre-heating of hot fluids required – major advantage
- Filtered waters to be re-injected into aquifer - no drawdown on water table
- **Zero-Carbon Lithium from geothermal** to be produced locally & transported to nearby battery factories

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**Zero Carbon Lithium – Potential for a World-First**

1 refer ASX Announcement 10 July 2019
Well Understood Lithium and Geothermal Brine Field

- Upper Rhine Valley geothermal fluids sampled over extended periods of time from multiple locations.
- Grades within the deep brine field up to 210mg/l Li.
- Thick Buntsandstein reservoir unit generally at 2,500m depth and has an average porosity of 10%.

**Commanding land position** in the brine field of over 78,600 Ha, of which over 51,000Ha is already granted.

- Selected areas based on commissioned study, defining most promising aquifers – Li grade, flow rate, heat.
- Very well understood brine field; large amounts of existing seismic and drilling data available for resource evaluation.
- Advantage of very short product transport distance.

1 refer Appendix 2 for sources of information, also ASX Announcement 10 July 2019.
Geothermal: Potential to be Largest Lithium Source in EU

Contained LCE (Mt)

<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>Contained LCE (Mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulcan Lithium</td>
<td>Germany</td>
<td>Exploration Target Max Estimate</td>
</tr>
<tr>
<td>Project</td>
<td></td>
<td>Exploration Target Min Estimate</td>
</tr>
<tr>
<td>Cinovec (ASX: EMH)</td>
<td>Czech Republic</td>
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<tr>
<td>Jadar (ASX: RIO)</td>
<td>Serbia</td>
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<td>San Jose (ASX: INF)</td>
<td>Spain</td>
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<tr>
<td>Barroso (AIM: SAV)</td>
<td>Portugal</td>
<td>5</td>
</tr>
<tr>
<td>Wolfsburg (ASX: EUR)</td>
<td>Austria</td>
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</table>

Chart compares resources from companies at different stages of development as detailed in Appendix 2, with Vulcan Lithium Project which is an Exploration Target expressed as a range of values as per KRX ASX announcement 20/08/2019. The Company is not aware of any new information or data that materially affects the information included in the announcement. All material assumptions and technical parameters underpinning the Exploration Target in the relevant announcement continue to apply and have not materially changed. The Exploration Target’s potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.
Lithium from Geothermal: Next Steps

- The lithium credits produced from the operation could greatly improve the economic case for geothermal fields world-wide.
- DLE requires pilot scale test work to prove it works with geothermal plants.
- Novel technology in a typically risk-averse market: financing assistance required both at feasibility stage during construction of pilot plant and full plant construction.
- Very large GHG-reduction potential; chance to make the EV transition a truly CO₂-neutral process.
- Targeting PFS completion by mid-2020, DFS completion by 2021 and first production by Q4 2022/Q1 2023.

1refer Appendix 2 for sources of information, also ASX Announcement 10 July 2019
Planned Project Timeline

Poised for 2023 Lithium Demand Inflection Point in EU
Situated in heart of EU’s battery and cathode gigafactories: very short transport distance to market

Direct Lithium Extraction (DLE) to be used on heated brines to precipitate lithium hydroxide directly

Potentially only “zero carbon” lithium product on the market - potential to charge a premium for geothermal lithium over other lithium sources

Strategic, secure domestic supply for EU OEMs at a time of global trade insecurity

Quick processing time using DLE means it can be responsive to market needs, unlike current sources

Targeting 2023 production start-up of Zero Carbon Lithium, from geothermal brine producing lithium hydroxide.

Poised for an explosion of EU lithium demand

1 refer ASX Announcement 10 July 2019
Thank you

ASX: KRX

contact@kopparresources.com

www.kopparresources.com
Appendix 1: Right Place, Right Product, Right Time

- EU pushing hard to have fully-integrated local lithium-ion battery supply chain, including lithium chemicals
- Unprecedented push from battery/cathode makers and OEMs to ramp up lithium-ion production
- 150kt LCE demand in Europe, just for battery production, by 2023, and **290kt by 2028**¹
- Zero domestic production of battery-grade lithium in EU – only high C-footprint South American and Chinese lithium products available
- OEMs seeking zero carbon raw battery material supply chain¹

³refer ASX Announcement 10 July 2019
## Appendix 2: Information for Slide 12

<table>
<thead>
<tr>
<th>Company</th>
<th>Code</th>
<th>Project</th>
<th>Stage</th>
<th>Resource Category</th>
<th>Resource Tonnes</th>
<th>Resource Grade (Li2O)</th>
<th>Contained LCE Tonnes</th>
<th>Information Source</th>
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<tbody>
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<td>European Metals</td>
<td>ASX: EMH</td>
<td>Cinovec</td>
<td>PFS Complete</td>
<td>Indicated &amp; Inferred</td>
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<td>0.42</td>
<td>7.17</td>
<td>Corporate Presentation Released 20 November 2018</td>
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<td>Rio Tinto</td>
<td>ASX: RIO</td>
<td>Jadar</td>
<td>PFS Underway</td>
<td>Indicated &amp; Inferred</td>
<td>135.7</td>
<td>1.86</td>
<td>6.24</td>
<td>Corporate Presentation Released 21 March 2018</td>
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<tr>
<td>Infinity Lithium</td>
<td>ASX: INF</td>
<td>San Jose</td>
<td>PFS Complete</td>
<td>Indicated &amp; Inferred</td>
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<td>0.61</td>
<td>1.68</td>
<td>ASX Announcement Released 22 August 2019</td>
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<td>Savannah Resources</td>
<td>AIM: SAV</td>
<td>Barroso</td>
<td>DFS Underway</td>
<td>Measured, Indicated &amp; Inferred</td>
<td>27.0</td>
<td>1.00</td>
<td>0.71</td>
<td>Corporate Presentation Released May 2019</td>
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<tr>
<td>European Lithium</td>
<td>ASX: EUR</td>
<td>Wolfsburg</td>
<td>PFS Complete</td>
<td>Measured, Indicated &amp; Inferred</td>
<td>10.98</td>
<td>1.00%</td>
<td>0.27</td>
<td>Corporate Presentation Released 22 March 2019</td>
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Appendix 3: Information Sources for Slide 10-11


*The Competent Person is not aware of any new information or data that materially affects the information contained in the above sources or the data contained in this announcement*